REMARKS

By this response, claims 1, 2, 4, 6-10, 14, 16-30 and 32-49 are pending, of which claims 1, 9, 10, 14, 28, 29, 30 and 32-34 are amended. The claims are amended to improve wording, but claim scope is not narrowed thereby for any reason related to patentability. No new matter has been introduced. Adequate descriptive support for the amendment can be found in the specification.

The Office Action rejected claims 1, 2, 4, 6-10, 14, 16-30 and 32-49 under 35 U.S.C. §103(a) as being unpatentable over Hayashino (U.S. Patent No 5,682,376 in view of Hyll (U.S. Patent No. 6,005,893). The Examiner is thanked for the courtesy of granting an interview conducted on August 2, 2002, with the Examiner's supervisor, Mr. Chin, attending.

During the interview, a proposed amendment to claim 1 was presented, and differences between the amended claim and cited references, Hyll and Hayashino, were discussed. The Examiner agreed that claim 1, after the proposed amendment, would be distinguishable from the cited references. The examiner also indicated that other claims would also be distinguishable from the cited references if similar limitations are added. The Examiner agreed that the claim amendment would be entered by filing an Amendment after Final. Allowance of the claims is subject to any further prior art search conducted by the Examiner.

Since the USPTO was unable to locate the file for this patent application as of the day of interview, the examiner indicated that an interview summary would not issued until the file is located.

This Response incorporates claim amendment presented in the interview. In light of the claim amendment, the obviousness rejection of the claims is respectfully traversed because the cited references cannot support a prima facie case of obviousness.

A *prima facie* case of obviousness under 35 U.S.C. § 103 requires three criteria be met. First, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Second, there must be some suggestion or motivation in the references themselves to modify the reference or to combine reference teachings. Third, there must be a reasonable expectation of success for the modification or combination of references. Further, the teaching or suggestion to make the modification or combination of prior art and the reasonable

expectation of success must both be found in the prior art, and not based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The teachings, motivations or suggestions to combine references must be based on objective evidence of record and cannot be resolved on subjective belief and unknown authority. In re Lee, Federal Circuit Case No. 00-1158 (January 18, 2002). Additionally, there must be particular finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge to the claimed invention to combine or modify references. *In re Kotzab*, 217 F.3d 1365, 55 U.S.P.Q.2d 1313 (Fed. Cir. 2000). Hayashino and Hyll, even combined, do not teach or suggest every limitation of the claims.

Claim 1, as amended, recites "a sending signal generating means for generating a plurality of carrier signals **conveying same signal contents** based on an input signal,...and a selection control means for controlling respective signal intensity of said plurality of carrier signals according to transmission characteristics of said plurality of carrier signals detected on the receiver side." In rejecting claim 1, the Office Action contended that Hayashino, by revealing an OFDM system, discloses every feature of claim 1 except for the selection control means. The Office Action relied on Hyll to alleviate this deficiency. Applicants respectfully disagree.

Hayashino is directed to a method for transmitting an orthogonal frequency division multiplex (OFDM) signal. A guard interval insertion device adds front and rear guard intervals to each symbol of the OFDM signal to reduce waveform distortion due to reflected waves. According to Hayashino, "an OFDM transmission system is adapted to divide coded data and sort the same into at least hundreds of carriers for multiplexing and transmitting the data (col. 1, lns. 17-21)." Namely, what OFDM systems do is dividing input bit streams into a plurality of segments and multiplexing the segments into separate channels to modulate a plurality of carriers. Although OFDM systems indeed use multiple orthogonal carriers in the frequency domain for modulation, the signals modulating the carriers are a plurality of **different** signal segments. Thus, the modulated signals do not convey same signal contents as required by claim 1. Hayashino also fails to teach "a selection control means for controlling respective signal intensity of said plurality of carrier signals according to transmission characteristics of said plurality of carrier signals detected on the receiver side," as required by claim 1.

Hyll, however, does not alleviate these deficiencies. Hyll is related to a multi-channel transmission for sending signal bits. The signal bits are divided into a plurality of bit segments and transmitted in different sub-channels by modulating carriers with different frequencies. Sub-channels are assigned different **numbers** of bits based on the transmission quality of that sub-channel: more bits are assigned to sub-channels with high transmission quality and vice versa. Thus, Hyll adjusts the number of signal bits for each channel, not the **respective signal intensity** of said plurality of carrier signals. Consequently, Hyll does not disclose "a selection control means for **controlling respective signal intensity** of said plurality of carrier signals according to transmission characteristics of said plurality of carrier signals detected on the receiver side," as required by claim 1.

Accordingly, Hayashino and Hyll, even combined, do not teach every limitation of claim 1 and cannot support a prima facie case of obviousness. The rejection is thus untenable and should be withdrawn. Claims 2, 4 and 6-8 depend on claim 1 and incorporate every limitation thereof. Therefore, the obviousness rejection of the claims should also be withdrawn based on at least the same reasons as well as their own merits.

Claim 9 is related to a sender having limitations comparable to claim 1, and further requires that the carrier signals are "non-interfering with each other both on the axis of frequency and the axis of time." Claims 10 and 29 also require that the carrier signals are non-interfering with each other both on the axis of frequency and the axis of time. As discussed above, neither Hayashino nor Hyll disclose these features. Thus, claims 9, 10 and 29, and claims depending thereupon are patentable over the cited references.

Independent claims 14 and 28, as amended, contain limitations comparable to those discussed in claim 1. As discussed earlier, neither Hayashino nor Hyll disclose these features. Therefore, the cited references, even combined, do not teach or suggest every limitation of the claims 14 and 28 and thus fail to support a prima facie case of obviousness. The obviousness rejection is untenable and should be withdrawn. Claims 16-27, 30, 31, 33 and 35-48, directly or indirectly, depend on claims 14 and 28 respectively, and incorporate every limitation thereof. Thus, the obviousness rejection of the claims should also be withdrawn based on at least the

same reasons discussed in claim 1 as well as on their own merits. Favorable consideration of the claims is respectfully requested.

CONCLUSION

Therefore, the present application claims subject matter patentable over the references of record and is in condition for allowance. Favorable consideration is respectfully requested.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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VERSION WITH MARKINGS SHOWING CHANGES MADE

IN THE CLAIMS

Please amend claims 1, 9, 10, 14, 28, 29, 30 and 32-34 as follows.

1. (Twice Amended) A sender for use in a communication system in which a sender and a receiver are connected to each other via a transmission line, said sender comprising:

a sending signal generating means for generating a plurality of carrier signals conveying same signal contents based on [converting] an input signal, wherein the plurality of [into] carrier signals are non-interfering with each other[, and then outputting said carrier signals]; and

a selection control means for controlling respective signal intensity [distribution] of said plurality of carrier signals according to transmission characteristics of said plurality of carrier signals detected on the receiver side.

9. (Twice Amended) A sender for use in a communications system in which the sender and a receiver are connected to each other via a transmission line, said sender comprising:

a sending signal generating means for generating a plurality of carrier signals conveying same signal contents based on [converting] an input signal, wherein [into a] the plurality of carrier signals are non-interfering with each other both on the axis of frequency and the axis of time [and outputting the converted signals]; and

a selection control means for controlling respective signal intensity [distribution] of said plurality of carrier signals according to transmission characteristics of said plurality of carrier signals detected on the receiver side.

10. (Twice Amended) A sender for use in a communications system in which the sender and a receiver are connected to each other via a transmission line, said sender comprising:

an encoder for generating a plurality of carrier signals conveying same signal contents based on [dividing] an input signal [into a plurality of divided input signals];

a plurality of filters, with said plurality of [divided input signals] carrier signals as input, for outputting a plurality of signals, said plurality of signals free from interfering with each other both on the axis of frequency and the axis of time; and

a sending signal synthesizing means for synthesizing the outputs of said filters based on transmission characteristics of said plurality of signals detected on the receiver side.

14. (Three Times Amended) A receiver for use in a communication system in which a sender and a receiver are connected to each other via a transmission line, said receiver comprising:

transmission line characteristics measuring means for receiving a plurality of carrier signals [that the sender send in after converting] conveying same signal contents based on an input signal [into said carrier signals] and for determining transmission line characteristics in respective frequency bands for said plurality of carrier signals;

receiving signal synthesizing means for synthesizing the outputs of said transmission line characteristics measuring means; and

selection control means for controlling [the] respective signal intensity [distribution] of said plurality of carrier signals in synthesizing carrier signals based on the transmission characteristics of respective carrier signals.

28. (Three Times Amended) A communication system in which a sender and a receiver are connected to each other, wherein the sender has:

a carrier signal generating means for generating a plurality of carrier signals with different frequencies based on an input signal; and,

a multiplication means for sending out on a transmission line said plurality of carrier signals modulated by said input signal, wherein the carrier signals, after modulated by said input signal, convey same signal contents; and,

wherein the receiver is provided with:

a transmission line characteristics measuring means for receiving the plurality of carrier signals modulated by said input signal from the sender and for determining transmission line characteristics in respective frequency bands of said plurality of carrier signals; and

a receiving signal synthesizing means for synthesizing said plurality of carrier signals on the basis of the transmission line characteristics;

wherein, at least one of the sender and the receiver includes a selection control means for controlling [the] respective signal intensity [distribution] of the plurality of carrier signals based on the transmission characteristics of the respective carrier signals.

29. (Twice Amended) A communication system in which a sender and a receiver are connected to each other, wherein the sender has:

an encoder for generating a plurality of carrier signals conveying same signal contents based on [dividing] an input signal [into a plurality of divided input signals],

a plurality of filters for, with said plurality of [divided input] carrier signals as input, outputting a plurality of signals, said plurality of signals satisfying the orthogonal requirements both on the axis of frequency and the axis of time; and

a sending signal synthesizing means for synthesizing the outputs of said filters and generating a plurality of [carrier] output signals,

and wherein the receiver comprises:

a transmission line characteristics measuring means for receiving said plurality of [carrier] output signals and determining respective transmission line characteristics [in the respective frequency bands] of said plurality of [carrier] output signals; and

a receiving signal synthesizing means for synthesizing said plurality of [carrier] output signals on the basis of [the] a measurement results by said transmission line characteristics measuring means.

30. (Twice Amended) A communication system as defined in claim 28, further comprising a selection control means for controlling said receiving signal synthesizing means with regard to the respective signal intensity [distribution] at the time of transmission among said plurality of carrier signals on the basis of the transmission characteristics on said transmission line of the respective carrier signals.

32. (Amended) A communication system as defined in claim 29, wherein there is further provided in either the sender or the receiver a selection control means for controlling said encoder with regard to the respective signal intensity [distribution] at the time of transmission

among said plurality of carrier signals on the basis of the transmission characteristics on said transmission line of the respective carrier signals determined by said transmission line characteristics measuring means in said receiver.

33. (Twice Amended) A communication system as defined in claim 28, wherein said sender includes a sending signal generating means comprising a carrier signal generating means and a multiplication means for each of said plurality of [divided input] carrier signals, and furthermore with a sending signal synthesizing means for synthesizing the outputs from the respective multiplication means.

34. (Twice Amended) A communication system as defined in claim 29, wherein said encoder in said sender selects a carrier to allot for each of said plurality of [divided input] carrier signals.